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A Skull of *Nothocyon* from the John Day Oligocene.

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AMONG verterbrate materials collected in the John Day beds of Oregon by a party from the University of Kansas in the summer of 1905 is a skull of one of the smaller species of *Nothocyon* which provides the upper and lower teeth associated. Inasmuch as this specimen seems to correct a misconception of long standing regarding the nature of the lower teeth of *Nothocyon lemur* (Cope), and because there is no immediate prospect of the collection as a whole being reported on, although it represents a fauna which just now claims the active attention of several paleontologists, we deem it proper to place this specimen on record and call attention to certain of its structural features.

The specimen (No. 600, Univ. Kan. Mus. Vert. Paleo.) is from John Day beds, Oligocene, Haystack Valley, below Turtle Cove, Oregon. Collected in summer of 1905 by Handel T. Martin, original field No. 113. The nature of the specimen is shown on Plate XXIX.

Without presuming to advance, at this time, any fixed ideas about the proper constitution of the genus *Nothocyon,* it is our opinion that several American species commonly referred to the Old World genus *Cynodictis* might better be placed in *Nothocyon,* and that assuredly there is confusion about the differential characters of certain species of the genus *Nothocyon* as they are at present recognized in the literature. Some of this confusion has clearly resulted from the lack of associated upper and lower teeth. *Nothocyon oregonensis* (Merriam, Univ. Calif. Publ. Dept. Geol. Sci., vol. 5, p. 11) although resembling *Nothocyon lemur* and *Nothocyon latidens* in several respects, is said to lack the posteroexternal tubercle at the base of the protoconid of M_1. Cope, as pointed out by Merriam (*loc. cit.,* p. 12), has referred disassociated lower jaws bearing teeth

of this nature to *Galecynus lemur* and has regarded the postero-external cusp at the base of the protoconid of M_1 as distinguishing *Galecynus latidens* from *G. lemur*. The associated upper and lower teeth here described do not bear out this supposed distinction and seem to verify Merriam's (*loc. cit.*, pp. 11-16) suspicion, which is, essentially, that *Nothocyon lemur*, as well as *N. latidens*, possesses a posteroexternal tubercle at the base of the protoconid and that the lower jaws referred by Cope to *Galecynus lemur* really belong to Merriam's (*loc. cit.*, p. 11) later-described *Cynodictis oregonensis*. In any event, the cranium (No. 600, U. K. M. V. P.), seems to answer best in size and proportions (see measurements below) to the description of *Nothocyon lemur* (Cope) and at the same time definitely shows the posteroexternal tubercle at the base of the protoconid of M_1 to be present.

This immediately raises a question as to the validity of the species *N. latidens*. In the absence of the necessary material we do not attempt to settle this point, but would suggest that several other of the differential characters ascribed by Cope to *N. latidens* and *N. lemur*, if constant, are sufficient to distinguish the two species, one from the other. Also, it occurs to us that the great variation in size of individuals of *Nothocyon* may have a corollary in the structurally similar, recent genus *Vulpes*. Of this genus two species (one of the *velox* or kit-fox group and one of the *fulvus* or red-fox group) occur together at certain localities. The variation in size between skulls of the two sexes, of at least some races of the red fox, is, as regards actual mass, constantly greater than that between skulls of the same sex of two distinct species of the genus *Vulpes*. Indeed, the skull of the female is scarcely one-half as large as that of the male in some races of the red fox. It is, to say the least, possible that a similar state of affairs existed in the genus *Nothocyon* of the John Day region in Oligocene time, and this possibility, we suggest, should be carefully investigated by anyone undertaking a critical, systematic analysis of the group. In this connection we might point out, also, that constant, striking differences in proportions of the skull, in addition to differences in actual size, exist between skulls of the two sexes of certain species of *Fissipedia*. *Mustela noveboracensis* of the eastern United States furnishes a case in point.

The specimen here described has a relatively short rostrum, well-developed postorbital processes, and in general size only slightly exceeds No. 10208, U. C. C. V. P., which Merriam (*loc. cit.*, p. 14,

pl. 2) has referred to *Nothocyon lemur*. Although the brain case is crushed, the temporal ridges appear to have been curved about as in No. 10208. P^3 has a well-developed posterior accessory cusp. P_3 and P_4 each, likewise, has a posterior, accessory cusp and in addition well-developed anterior and posterior basal tubercles. P_2 is not preserved. M_1 has a well-developed cingulum extending along the entire lateral base of the tooth, except for a short space at the base of the protoconid. The hypoconid is developed as an antero-posterior ridge. The entoconid is longer than wide, but has a tendency to be conical. Immediately anterior to the entoconid and just posterior to the metaconid there is a well-developed conical cusp on M_1. Although the talonid of this same tooth may be spoken of as basined, the posterior margin, between the entoconid and hypoconid, is lowest and gives it a troughlike, rather than a strictly basin-like, structure.

MEASUREMENTS OF *Nothocyon lemur* (COPE).

(No. 600, Univ. Kan. Mus. Vert. Paleo.)

Condylobasal length	73±
Width across palate at P^4	24±
Length of upper tooth row, C^1—M^2	32
P^2, length x breadth	3.9 x 1.6
P^3, length x breadth	5.2 x 2.5
P^4, length x breadth	6.7 x 4.7
M^1, length x breadth	5.3 x 6.3
M^2, length x breadth	3.1 x 4.5
M_2, length x breadth	4.3 x 3.0
M_1, length x breadth	6.9 x 3.4
P_4, length x breadth	5.4 x 2.6
P_3, length x breadth	4.5 x 2.0

PLATE XXIX.

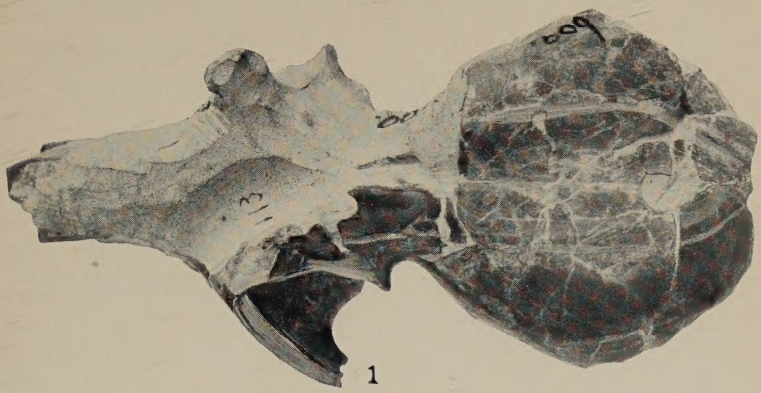
FIGS. 1 to 3.—Photographs, retouched, of the skull of *Nothocyon lemur* (Cope), No. 600, Univ. Kan. Mus. Vert. Paleo.; John Day beds, Oligocene, Haystack Valley, below Turtle Cove, Oregon. Collected in summer of 1905 by Handel T. Martin, original field No. 113. All figures 1.5 x natural size.

Figs. 1.—Dorsal view of skull.

2.—Lateral view of right lower jaw.

3.—Ventral view of skull.

PLATE XXIX.



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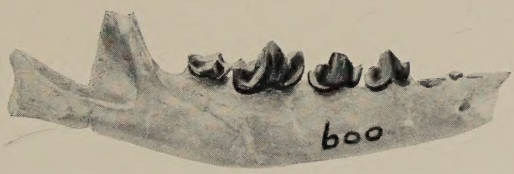

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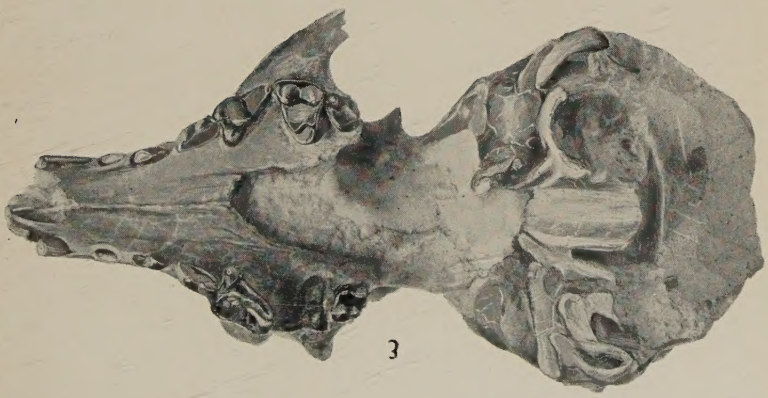

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